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ABSTRACT

Designed as a forum on teaching and learning in Utah's two-year institutions, this annual publication issues a yearly call to faculty, administrators, students and others for papers on any matters of interest to Utah's community colleges. This 1992 issue of "Focus" includes the following articles: (1) "Videocassette as Text and Harbinger of Hypertext," by Ace G. Pilkington (describes the use of videocassettes of films and plays to enhance the learning experience for students); (2) "Can Computers Generate Confidence?" by Kent Templeton (discusses the use of special computer programs and an electronic bulletin board to build student confidence in a basic writing course); (3) "Using PC Computers To Teach Students How To Think Critically," by Roger D. Lee (describes the application of the Robert Karplus learning cycle to develop critical thinking skills in conjunction with a personal computer); (4) "Hands-on for the Inexperienced," by Mark Soderborg (cautions against exclusive training in desktop publishing techniques and calls for experience in traditional approaches to writing and printing); (5) "Technology, Tenacity, and the Nontraditional Student," by Nancy M. Smith (compares data on older and traditional student enrollment and grade point average at Utah Valley Community College--UVCC); (6) "Accessing the Inner Student: Preparing the Ground To Ensure Students Achieve Their Highest Potential," by Toni Pickall (describes nine blocks to student learning); (7) "Implementing Technology Assisted Instruction in the Classroom," by Richard C. Darnell; (8) "Mathematics and the Graphing Calculator," by Scott L. Mortensen; and (9) "Diversity through a Core Approach to Ethics," by Elaine transfer at any time. Nine recommendations for increasing transfer humanities course at UVCC). (PAA)

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Videocassette as Text and Harbinger of Hypertext

Dr. Ace G. Pilkington

Although in the last decade of the twentieth century there is nothing new about the technology of the videocassette or innovative about putting a tape into such a machine in the classroom, it can be a powerful tool, not merely as an audiovisual aid or a means of attracting student attention but as a mechanism for getting at the very idea of text, for illuminating the purposes of scholarship and, perhaps most important, for bridging the gulf between the old print world and the new informational world of multimedia and hypertext. In this sense the videocassette is new technology, and many educators and their students have not yet completely adjusted to all of its implications since attitudes and assumptions are not as easily replaced as hardware.

Mere Entertainment?

Traditionally, film in its many forms has been used in the classroom as a brief and flickering illustration for material which was to be covered in depth in the instructor's lectures and/or the printed text. Indeed, in some cases, film has been a time filler when instructors were physically (or mentally) absent from class, and general attitudes to film as mere entertainment have reinforced this trivialization. There is still a tendency to look askance at an instructor who uses "too many" visual aids, and some students greet a film as a sort of holiday from the regular work of the course.

The very ubiquity of film in our culture and its preeminent position as *the* the entertainment from of the twentieth century is a problem. While students understand film better than almost any other medium for presenting information, they tend to take it less seriously. There is even a level of resentment that sometimes enters in when students are expected to treat film in the way they treat books, as though they are being deprived of something, as though a last haven of uncomplicated fun is being taken from them.

In the past twelve years, I have used videotapes as texts in three different kinds of courses—film classes, Shakespeare classes, and composition classes—and I have discovered at least as much as my students have through the procedure. Using videotapes in a film class is perhaps the most obvious of these choices; only fanatical cineastes are likely to object to the procedure of using what is, in genereal, a better, more easily controlled, and less expensive medium. In fact, Tim Bywater, one of my colleagues who also teaches film, tried his film class both ways, first with 16 mm prints and then with videocassettes. As a film scholar, he started with a prejudice for reels and against tapes but was quickly converted to the television medium, largely because with older movies, television provides a consistently better image. (Admittedly this is not true for more recent films, but ease of use and comparative cost counterbalance image quality.)

For my film students, the videocassette was what they expected. An in-depth study of movies was the surprise. Test scores in my film classes tend to be lower than scores on tests of comparable difficulty in other courses. And when they are asked for an explanation, my students suggest that *studying* a film requires a major change in attitude. "We watch movies to kick back and relax," they object.

New Sophistication

By the end of the quarter, this attitude has changed, and the scores have risen. My students typically acquire a new level of sophistication but also typically they have a tendency to lament their lost innocence. "Now, I analyze everything I watch," they complain. "My friends hate to go to movies with me," they frequently add. They also lose their vision (shared even today by some film scholars) of a film as a single, indivisible thing, a total viewing experience that can be recaptured

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in some pale sense in memory but never precisely re-experienced without re-entering the temple of the movie theatre. Of course, the omnipresent videocassette is rapidly destroying that vision, and will do so without help from film instructors, but the version of the film as a *made* thing, as something assembled from smaller units and created by a group of people working together and sometimes struggling against each other is particularly valuable in a culture such as ours which is all too willing to take everything, including thirty-second commercials, at surface value.

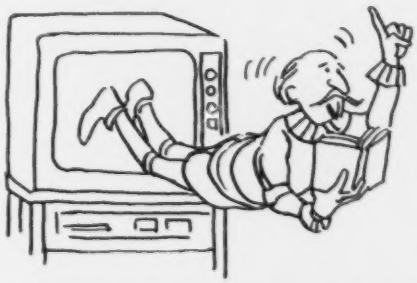
When they are asked to indicate the most important thing they learned in the film course, my students most often say, "It has made me more analytical." It is interesting but not surprising that what they value most is also what they find most troubling; thinking can be an unsettlilng experience. Clearly though, the use of the videocassette, which allows them to stop, start, and essentially control films, and their greater facility with mental stopping and starting, or analysis, are benefits which they value. To be empowered is in some sense compensation for being deprived of mindless entertainment and unexamined assumptions.

Shakespeare on Video

There are many reasons for using the videocassette in the study of Shakespeare. Not the least of these is that "These performance texts can help to expand and explain the printed originals from which they are fashioned, when static texts acquire motion and flesh. New interpretations may emerge from the examination of stress and counterstress, from the weighing of gestures and other small signs lost on the immobile inadequacy of the page. Such interpretations may serve as confirmations of or contradictions for other kinds of criticism, a crucible of practice where theories interact and are tested" (I am quoting myself here, from *Screening Shakespeare from Richard II to Henry V*, University of Delaware Press, 1991, p. 156).

In this case too the purist may object that the shift from one medium to another, film to video or stage to film is a dilution and a desecration, but students frequently discover Shakespeare the playwright (as opposed to Shakespeare the classic, or Shakespeare the dull icon of English classes) on videocassette. Many students who do not have the experience or expertise to stage plays in their minds find out what Shakespeare's words really mean only when they see him performed. The videocassette also makes it possible to look at filmed stage productions, movies, and made-for-television Shakespeare, and as a result, to examine the nature of the medium that conveys the message and the changes the medium makes.

Again, the majority of my students start from an uncritical position, accepting a performance as a given, and in most cases, accepting that performance as the inevitable embodiment of the text. For some of them the first encounter with multiple productions of a single play is shocking. They typically react with outrage when the performances differ significantly, seizing on one incarnation (usually the first to be viewed) as the "right" version and condemning others as deviations from the true text.



However, this initial, uncritical position is almost always superseded, most often in mildly painful (or, depending on the student's flexibility, gently pleasurable) steps. The first of these advances is the creation of the ideal performance text. Retaining the assumption that an ideal production is possible, the student nevertheless admits that those she (or he) has seen do not qualify for that accolade. The student then imagines the perfect production, selecting bits and pieces from existing performances and fitting them together like a mobile jigsaw. The perfect production is, of course, thought to be the correct staging of the text, deriving its authority from that sacred source.

While some students remain at the "perfect production" level, many more will have taken additional steps by the end of the quarter. The next "stage" of development involves admitting that all productions are imperfect, not only because of the inadequacies of actors and the insufficiency of funds but also because cultural differences between Shakespeare's time and ours make every performance a compromise. Here, the videocassette is especially helpful since it focuses attention on the changed message a different medium sends and leads on to speculations about the change an audience may make by the way it receives the message.

At this point, I talk about the uncertainty in Shakespeare's printed texts. Once the students have grasped the idea that the manuscripts which stand behind various quarto and folio editions disagree, that the manuscripts themselves may have been imperfect, and that even if they were not, the printers introduced errors, they are ready to abandon the idea of any single text as a sacred source of meaning. The printed version becomes as shifting and flowing as the performance text; one edition of Shakespeare can be as different from the next as one filmed production from its counterpart.

The final discussion here concerns Shakespeare's intention and the possibility that as a playwright, he deliberately created a flexible text which could survive multiple editions on the page and stage. And this eventually takes us back to the recognition that no single production can play everything which is in a Shakespearean text (and to the position, tenaciously held by many directors, that Shakespeare himself cut his plays in performance). As a result, we have a play (existing completely, by definition, only in performance) that cannot be completely performed because of the text's richness. The result is a text which can be realized only in overlapping and sometimes contradictory incarnations. While this may look like the perfect performance text in another form, inviting the students to mentally assemble all of the meanings, an awareness of the contradictions which the text contains and an ultimate uncertainty about the very words which form it prevent so comparatively easy an answer.

New Perspective

The students come away from these discussions with a new perspective on the nature of text, having learned to see print and electronic media as equivalent in some ways. They have also learned that meaning is a more elusive, more complicated thing that they had previously imagined. And perhaps most importantly, they have begun to think of texts and the meanings they embody as something larger than words on a printed page; they are to some extent prepared for a computer system that will access nearly everything.

Research Papers

Using videocassetes in English 201, the research paper course at Dixie College, is possibly innovative and certainly unorthodox. My students are required to write persuasive papers about films currently available on videocassette, and they are explicitly forbidden to write on other subjects. The course began as an experiment designed to reduce instructor boredom (How many papers about euthanasia and gun control can one bear to read?) and student plagiarism. It was also designed to provide a compromise between papers written from student experience ("What I Did on My Summer Vacation") and papers written entirely from enforced student reading. Since film contains visual and auditory data as well as words, it provides a broader background for the writing.

My students are considerably more willing to write about movies than about current events or social problems, and their response to the experiment has been almost entirely favorable. Content problems in papers have been substantially reduced, and even mechanical errors are less frequent as a result of greater student involvement in what they are doing. However, the most interesting (and in some ways the most positive) result has been that students are forced to think and write about videos as texts. Because they are writing persuasive papers, they must find evidence within the films, developing a facility for locating the correct scene and transcribing not only the words but also the relevant actions and backgrounds. They must deal with a text that is at once linear and pictorial, with an information environment so rich that only repeated

viewings of small segments will yield the details they need.

Meaning Behind the Media

When my students write their persuasive research papers, I encourage them to make comparisons of the same narrative in different media, a novel turned into a movie, a play and its filmed descendent, or even a movie and its remake (particularly if one version was a film and another was made for television). Here they must come to terms with information first and medium second; the text is transposed from one narrative carrier to another, and they must track its various incarnations and critics' print commentary on those incarnations. By the time they have finished, my students have caught a glimpse of the future of text, its protean shifts and the meaning which burns behind the media. They have begun to think about information in a new way, have begun to modify behavior and change assumptions because they have fully explored and assimilated the possibilities of that comparatively old technology the videocassette.

Can Computers Generate Confidence?

Kent Templeton

Another quarter ends and I sit in my office wondering whether you can really teach people to write. I follow the current composition theory: I emphasize the composing process; I provide varied writing situations and emphasize the reader and the purpose in each situation. But after each quarter ends, I can't help but wonder whether the students who leave the class as competent writers didn't enter the class as competent writers. Those who are successful seem to enter the class expecting to the successful, and those who do poorly come expecting to do poorly. More than their past experience with writing, those expectations often prove to be the most significant barrier or boost to the students' success.

Most basic writers, those with limited writing experience, are apprehensive and insecure about their abilities. Because they haven't had much if any success in writing, many basic writers don't believe they can succeed. As a result, they come to class expecting to do poorly, and all too often they fulfill their own expections.

Building Confidence

This past year I discovered (somewhat by accident) an approach to help students overcome the barrier of apprehension and insecurity. I developed and began teaching a self-paced class for basic writers. I used a networked system of computers with a variety of writing software programs to allow students to review and practice the course material at their own pace.

The strength of the course wasn't what I expected. It wasn't the individualized pace, the appeal of the word processor, or the immediate feedback of computer tutorials that helped the students succeed. Using computers in this self-paced class built something more important in students then an ability to write complete sentences. It built confidence.

Gaining Control

Control was one aspect of the class that fostered confidence. More than control over their pace, the class gave the students control over their progress and success. Many basic writers come into the classroom skeptical about their ability to affect real change in their writing. Like a person flying a plane set on auto pilot, they have the controls in front of them, but nothing they do seems to change the course of the plane. For basic writers change comes more often as a result of an accident than as a result of a conscious effort on their part.

The computer programs I use in the class put the controls back in the students' hands. For example, among the programs that students use in the course is a quiz program that enables students to practice punctuating. The program presents texts stripped of punctuation. Students receive a score for the number of tries it takes them to insert all the missing punctuation. More importantly, the program gives the students the option of either saving or discarding their scores. A student may take a quiz four or five times before *they* decide to keep the score. As a result, virtually all the students eventually get scores of between 90 and 100 percent.

That 100% score may not mean that the students will never write another sentence fragment or confuse the colon with a semicolon. However, to the students, the 100% score does mean that they can gain control over their progress and succeed. That sense of control inspires confidence. The next day when they enter class, they *know* they can get another 100%. It may take a while, but they know it can happen. They come to class anticipating success.

Praise

Those scores also offer an important opportunity for me to encourage and praise the students' efforts. Praise in turn shores up the students' con-

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fidence. The confidence then pays dividends when the students write their papers. For many basic writers it takes confidence just to get the pencil moving or, as is the case in this class, the keyboard keys moving.

The students write all of their papers on a word processor. For many writers the word processor offers conveniences which make revising and editing more efficient. For the basic writer whose conveniences build confidence, a particularly important commodity when it comes time to revise.

One of the most common problems for those of us who teach writing is convincing students to revise: to delete or add a sentence or to change the point of a paragraph or refine the thesis of their paper. In an effort to encourage students at all levels to revise, I often tell them their paper is not "written in stone." For basic writers, though, their papers *are* as good as written in stone. Basic writers may work two or three hours to coplete the first draft of a one page paper; they are understandably reluctant to make many changes. While for an experienced writer that first page represents the beginning of a welcome process, for the basic writer it represents a thankful end to an awkward and sometimes painful ordeal.

Ease of Revision

Yet, with a little coaxing basic writers can learn to compose on a word processor, which can make the process of creating a thoughtful and readable piece of prose a little less painful. In fact, I require the students to submit a computer generated draft of their papers. Without question, the ease of revising on a word processor encourages them to make more changes to their text. But something else happens when they begin composing on the screen: they gain control over their text, and with that control comes confidence. What was once a one-time stab at success now, like the punctuation quiz, becomes a series of attempts that the student knows, given the time and effort, can result in a successful paper.

The word processor inspires a willingness to make mistakes, to write and rewirte. They see their text not as a fragile relic that will break apart if they dare change it but as a pieces of malleable material, a medium that *invites* change. And, because any changes can be as temporary or as permanent as they want, the once paralyzing fear that whatever they do will only make things worse is relieved. They are willing to take more risks, to experiment with different sentence structures, to try different wording, to orgainize and reorganize. In short, they begin to do what all writers do: try, fail, and try again.

Sometimes I sit down next to a student who has never used a word processor, and we work on their text together—adding words, deleting and moving sentences. Often, I can see the student's confidence grow. After ten or fifteen minutes, a student who was reluctant to change anything more than a period for a comma, adds a new sentence to support his or her point or deletes a section that seems redundant.

The typed finished look of the computer generated document also fosters confidence. I even encourage students to print their finished papers on the laser printer. Seeing their ideas in clean professional looking print, the same way they see ideas presented in their textbooks, seems to validate and lend credibility to their efforts. They take pride in that finished piece. I realize there is a danger in equating successful writing with the appearance of the page, yet if that page can inspire them to keep writing, I believe the quality in the writing will follow.

Electronic Bulletin Board

Finally, using computers with basic writers fosters confidence by providing a forum in the form of an electronic bulletin board for students to read and comment on each other's work. Much like a conventional bulletin board, the electronic counterpart (which requires a networked computer

system) allows students to "post" their writing for others to read.

Briefly, the students read articles and, using a pen-name, write short responses on the bulletin board. I also require the students to read their peers' entries and post their reactions. In what amounts to a dialogue between readers and writers, three or four students will often write reactions to the same student-entry. The bulletin board program gives the students the important dimension of a reader of a reader and turns a group of individuals all writing for the instructor into a community of writers all writing for each other.

For many writers, experienced and inexperienced alike, the prospect of an audience can create some anxiety. That anxiety, however, can be healthy, especially for basic writers. Instead of anxiety about whether a paper will be an A or C, the presence of a reader makes the writer anxious about more worthwhile concerns: "Will the reader understand what I meant?" "Should I add another example so they won't be confused?" The act of writing is no longer an attempt to please an instructor. It's a genuine act of expresssion and commuication that will be read and responded to by others.

At a very basic level, writing for and responding to your classmates takes nerve. At first some students are reluctant to write on the bulletin board. Eventually, though, most students enjoy it. Gradually they build up enough confidence to express their ideas and to react honestly to their peers.

Simply reading other students' work can also boost a student's confidence. Like a recital for beginning piano students, each student writer listens and takes some comfort in the struggles, the mistakes, and the achievements of others who are in the same situation they are.

Learning to write is difficult and sometimes complicated. It takes years of trail and error, of writing for different audiences for different purposes. It doesn't happen in ten weeks. So, what can I hope to teach the students who will be sitting in my basic writing class next fall? I can teach them that they can succeed. I can give them a sense of what that success is like. I can put that success within their reach. Actually, I try to accomplish those objectives in all my classes. Yet, I have found in the computer an unexpected and effective ally in reaching those objectives. The computer has helped bring success a little closer to each student. Most students in my basic writing class know they can succeed. They expect it. They anticipate it. And, as often happens in a writing class, they fulfill their own expectations.

Using PC Computers to Teach Students How to Think Critically

Roger D. Lee, Ph.D.

Introduction

Teaching students how to think critically is not new. The roots of critical thinking can be traced to Plato's Academy that serves as the basis from which modern Western universities ultimately arose. However, as advances in technology and in the sciences have occurred, many institutions of higher learning departed from the Socratic teaching style and began to focus more didactic teaching and the transmission of information.

Today as a result of modern computer technology, the Information Age has evolved and generated such a vast quantity of information that in many instances students lack the capabilities to process and use the information. Accordingly, students must develop and master their critically thinking and reasoning skills in order to apply the wealth of information that is readily available to them. Since modern technology has largely created the abundance of information, modern technology can be applied to equip students to think critically in the application of information.

Thus, because of the technological advances, educators must reevaluate their roles as information disseminators and concentrate on teaching students the skills necessary for self-directed inquiry and self-educating techniques. Through means of PC computers, students with technical assistance from competent instructors can apply a heuristic method of learning. For example, computers can generate alternative scenarios relative to real-world problems from which students can use the feedback to move from concrete experiences to abstraction, exploratory problem solving, and model building. To engage in what John Dewey called "reflective thought" should be the essence of teaching in institutions of higher learning. The extent to which students learn to think critically is predicated on their ability to set aside their own perceptions of truth and reflect on alternative solutions or approaches. With proper application, PC computer technology can provide the opportunity for students to engage in "reflective thought."

Thus, the primary purpose of this paper is to present a model or an approach to enhance the students' capabilities to think critically by using a PC computer. The model will involve a learning cycle approach, developed by Robert Karplus. (Karplus, 1978). The learning cycle is comprised of three elements: (1) exploration of the subject material; (2) creation of relevant concepts; and (3) application of the concepts. The fundamental thrust of the paper will be to explain how a PC computer can be used in applying the learning cycle model with the intent to develop students' capacities to think critically. Before discussing the learning cycle approach, an explanation of abstract thinking is provided as a basis on which critical thinking is built.

From Concrete to Abstract

One of the primary goals of higher education is to empower students to move from a self-centered universe, which is based on their own limited personal experiences and concrete realities, to a more abundant and more abstract realm where a multiplicity of values, theories, and verities exists. Students cannot learn to think critically either with or without computer technology until they can, at least momentarily, set aside their own values and beliefs of the truth and reflect on alternatives. Included in this process of "reflective thought," is the notion that students must be taught to abstract from their own immediate experiences to enhance and expand their critical thinking capabilities. Thus, to engage in critical thinking, students must develop their abilities to abstract and identify principles and concepts relative to their specific experiences that can be

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generalized to other experiences. Perhaps one of the most formidable obstacles in college teaching is helping students get some distance from their own values and beliefs so that they can entertain more abstract modes of perception and thinking.

The ability to consider alternatives, formulate generalizations, entertain new theories, and suspend biased judgment is the essence of abstract thinking and the basis on which critical thinking is nutured. At this level of thinking, the PC computer can serve as a viable resource to students. The PC computer is a tool that can equip students with the ability to develop new alternatives for consideration and assist them in establishing generalizations that may be universally applicable. Various alternative scenarios can be easily facilitated and considered by the computer. The application of the PC computer will be addressed in more detail after the discussion of the learning cycle model is explained.

Hence, the order of intellectual development is crucial: from concrete experience to abstraction. This order may seem obvious and axiomatic; however, with most traditional teaching today the order is reversed. Most class room instruction begins with the abstractions such as theories, principles, theorems, and concepts after which the instructor asks the students to confirm those abstractions through some concrete method of verification. For example, in the life sciences, the theories are usually presented in the classroom before the students reenact or confirm them in a laboratory. With respect to mathematics, most calculus text books begin with the theories, properties, and rules after which exercies are presented before the application problems are discussed. In humanities courses, the instructor normally introduces the themes, concepts, and generalizations first and then asks the students to find examples of them in the real world. Thus, traditonal teaching usually reinforces and conditions students to first confirm the abstractions or theories, principles, and assumptions associated with the subject material, rather than to encourage students to discover the abstractions for themselves. For this reason, some students may be stifled to some extent with their formal education. By presenting the abstractions first, the instructors rob the students of the opportunity and pleasure of discovery. According to J. A. Kinney, when instructors teach abstractions first in an artificial context, devoid of any association with the real world as the students understand it, the students are involved with "disembedded learning." (J. A. Kenney, 1980). This means that the students are learning superficially, and they are not learning how to dig out the general application from their specific field of experience.

Rather than teaching abstractions in and of themselves, instructors should create a problem-solving atmosphere that encourages students to engage in the process of abstract thinking. Kinney states: "Teachers should spend time explaining the problem and devise teaching strategies that do not allow students to think they are being asked to perform outside a meaningful context but place them at the center of expanding concentric circles." (Kinney, p. 7) Because concentric circles have a common center to which students should be placed, students are the focal point. Thus, as students move away from their limited, ego-centered views, they will enhance their abstract reasoning and critical thinking abilities which are the hallmark characteristics of an educated person.

The PC computer can be a very useful tool in developing this problem-solving atmosphere in a classs. For example, rather than first explaining the algorithm, formulas, and theories associated with correlation analysis in a statistics course, the instructor could illustrate concrete specific examples of the application of the concept such as the relationship between smoking and lung cancer. The students could then pose their own examples and problems associated with correlating two events.

They could begin to devlope their own hypotheses relative to correlating two or more variables.

Applying the fundamental tenets of Piaget's learning theory to classroom instruction requires an active larning environment and not the traditional professor-lecture style in which the students are passive receptors of knowledge. In an active learning environment, students formulate their own questions, identify their own problems, develop alternatives, and generate recommendations. The computer with the appropriate software can assist the students in formulating their own problems and developing options or scenarios from which recommendations can be drawn. Thus, with the instructor's assistance, students begin to explore and experiment with materials and move toward understanding the abstract concepts and principles once they have a grasp of the concrete application.

As Lawson and Renner suggest: "It is the experience with the materials of the discipline that produces the person who can understand abstract content, and not studying abstract content that produces students who can interact with the material and invent abstract generalizations." (A. Lawson and J. Renner, 1975, p. 338.) Through the use of a PC computer lab, students can begin to experience and understand the concrete application of the materials associated with their particular discipline from which the theories become more understandable. To understand more fully the application of the PC computer in teaching students to think critically, the learning cycle approach is discussed.

The Learning Cycle Approach

Robert Karplus, former dean of the graduate school at the University of California at Berkeley was one of the first instructors to apply Piaget's learning theory. Karplus and his colleagues developed ways to apply Piaget's concept of the movement from concrete to abstract level of thought to their classroom activities. They developed a simple three stage model called the "learning cycle." The primary purpose of the learning cycle is to involve students and arouse their curiosity in the exploration of problems related to the course, and thereby stimulate them to abstract levels of thought. The three stages, exploration of materials, invention of concepts, and application of concepts are discussed below.

In the first stage, exploration, the instructor must first identify clearly the key, concrete, real-world applications to be taught. For example, in a Human Resource Management Class, one of the key, concrete applications deals with contemporary challenges with respect to equal opportunity and affirmative action in hiring practices of organizations. The key, concrete learning objectives may include: (1) identify changes in the lifestyles and attitudes of the work force that affect hiring practices; (2) discuss objective criteria that serves as a framework within which hiring occurs; (3) describe reverse discrimination and equal protection under the law; and (4) explain government acts and court decisons related to fair exployment practices. The instructor selects materials that relate to those issues and the students begin working with these materials and discussing their explorations with other students and the instructor. The most crucial aspect of this stage is the establishment of a learning environment in which probing and raising questions provide an inherent challenge to the students' present mind set or mental structures. The instructor's role is one of catalyst and facilitator and not lecturer. Moreover, the instructor should raise additional questions, offer encouragement, and insure that the students' exploration activities begin to lead in the direction of the abstractions the instructor intends to teach after sufficient concrete examples are presented. The PC computer is not necessary during this stage.

In stage two, invention of concepts, the instructor assists students in the development of generalizations, hypotheses, principles, and concepts that help explain their explorations. Through this process, students are guided gently to understand abstraction in a purposeful context. Instructors may augment the students' exploration process by introducing additonal experiences or information as a basis on which the formulation of new mental structures and thinking may occur. For example, one generalization or theory may be to treat equals equally, and thereby insure equal protection under the law.

The second stage of the learning cycle is generally the most challenging for instructors. They must not rush to draw conclusions for the students, but rather, they must let students grapple with the issues through a trial and error process, and thereby ultimately develop new ways of thinking about the material under discussion. Similar to stage one, the PC computer may not be necessarily important.

In the third stage of the learning cycle, application of the concepts, students apply the concepts and generalizations they have abstracted and formulated in stage two. The purpose of this phase is to reinforce the newly developed mental structures and abstractons. The role the instructor plays during this stage is one of mentor and supporter. The instructor should support the students, as they test their abilities to apply newly developed abstractions to new situations.

In this stage, the PC computer can be very valuable. In the context of human resource management, PC computer software is available that is applications-oriented and user-friendly. Thus, the PC computer becomes a tool to apply the new abstraction already learned. Moreover, the students are engaged in problem-solving a real-world human resource problem. Thus, the students first learn from concrete examples relative to hiring issues, (stage 1), then abstract to new modes of thinking about the issues, (stage 2), and finally apply their newly acquired abstract theories to a real-world problem (stage 3).

To illustrate the application of the computer in stage 3, one of the PC projects could deal with equal employment opportunity and work force management. The project could have the following learning objectives: (1) understand the impact of equal employment opportunity considerations in work force management; (2) construct a utilization and availability analysis for the company's managerial employees; and (3) construct a criteria as a basis for reduction in force. Once the reduction in force is completed, a new scenario could be easily generated by modifying the criteria by which the reduction in force occurred. Thus, the "what if" questions or sensitivity analysis and the development of additonal alternatives is easily handled by a computer. As a result, the newly discovered abstractions are reinforced by the PC computer through the use of real-world application projects. Frequently students have had work experiences with respect to human resource management, but they often lack the theoretical or abstract background associated with the field. The computer projects would provide students with an opporutnity to reflect on the issues associated with the real-world case in an easy to use, self-directed, applications-oriented package. A sound knowledge of human resource theories and concepts combined with experience in using actual human resource data should enrich the students' learning process and their ability to think critically.

Karplus and his associates applied Piaget's concept of the movement from concrete to abstract levels of thought in the physical sciences by applying the learning cycle approach. They involved their students with the exploration of concrete experiments in physics in an effort to arouse their curiosity and thereby lead them to abstract levels of thought. The application to other disciplines is possible but requires instructor creativity.

The humanities are particularly challenging because of the seemingly lack of concrete examples from which to begin and insufficient computer software that allows students to explore alternatives. Nevertheless, with diligence, a resourceful instructor in humanities could develop a learning cycle for his or her discipline. For example, an instructor of literature could develop a learning cycle around the concrete notion of a hero or heroine and a tragedy. During the exploration stage, the instructor could assign the students to read Oedipus Rex and ask them to develop questions as to what is occurring in the story in terms of concrete examples related to the real world. Other works could be assigned such as Hamlet. The instructor, using the students' questions about Oedipus Rex could be used to assist them in developing and expanding common themes, and thereby inventing new ideas or abstractions. In the application stage, the instructor could ask the students to read another work such as Hedda Gabler and analyze, compare, and contrast this work in light of the newly discovered abstractioins learned from reading Oedipus Rex and Hamlet. Instructors interested in examples of learning cycles for both

the sciences and the humanities are referred to R. G. Fuller. (Fuller, 1977).

Summary

Because of time constraints, using the learning cycle in conjunction with a PC computer creates tension between the delivery of the content and the teaching of the critical thinking process. Obviously, it takes a significant amount of time for students to mentally wrestle and grapple with materials and develop their own questions and hypotheses. Instructors who want to apply the learning cycle approach have to cut down their normal content presentations significantly. Accordingly, some instructors may feel that the students are getting short-changed by not covering the traditional amounts of course content. However, the trade off seems reasonable if students make dramatic improvements in their ability to think critically.

Using the learning cycle approach and self-directed study time with a PC computer is a radical departure from the traditional methodology of college teaching. Moreover, giving valuable class time for students to engage in "reflective thought" presupposes that students will infact reflect vocally. This reflection process may involve silence. Based on experience of this writer, sixty seconds of silence in a classroom seems interminable for most students and instructors. Thus, the students must be equipped properly to engage in this type of learning environment.

In conclusion, using the learning cycle approach integrated with PC computer technology requires instructors to spend most of their class time as referees, coaches, and mentors, rather than lecturers and purveyors of the truth. For most instructors, this is a formidable role change and teaching paradigm shift; however, the shift could be very worthwhile and beneficial to students. The students will move from their immediate concrete experience and begin to develop new mental structures and abstractions, and thereby engage in purposeful critical thinking. This will occur only if the instructor (1) creates a classroom environment of discovery and active learning, and (2) encourages students to explore new modes of thinking.

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"Hands-on" for the Inexperienced

Mark Soderborg

When Lord Acton wrote "Power tends to corrupt, and absolute power corrupts absolutely," he almost certainly wasn't talking about modern technology, but the phrase does seem to apply to certain technologies now being used in the classroom. Desktop publishing and desktop video production (among the growing multitude of desktop capabilities) are giving teachers and students involved in print and broadcast journalism an enormous amount of power that a previous generation of journalists may not even have dreamed possible. And, while that power can be abused, it doesn't have to be.

When I began my studies in journalism I typed my articles with 60 characters to the line, double-spaced so that an accurate, or fairly accurate, length of the story could be determined. I carefully and tediously counted each letter of my headlines so that when the typesetters did their job the headline would fit in the available space (the letters j, f, l, i, and t got one count; M and W got two counts; most letters got one count; and a few got one and a half counts, and so on). I would dummy a page, making sure all codes were right, to tell the typesetters about column size and spacing, and what size, font, and style of type to use. Then I would send it off and sometimes never see what the finished product looked like until it was on the news stand.

Today, students use word processors and computerized page layout programs that allow them to see exactly what size, font, and style the type is being set and exactly how much space the story takes up on the page. There is no need to count headlines when you can see immediately whether or not it fits the available space. As a matter of fact, most of my students wouldn't know what "counting a headline" means. Even page dummying seems to be dying out, not because it isn't being taught, but because it is so easy to do without. With that much power at their command, students are no longer acting just as reporters or copy editors, or in any single assignment; they are becoming (even beginning students) a whole production team in and of themselves.

The problem with having power without previously gaining knowledge is that it is so easy to abuse that power. For example, without training in the effective use of typography a student often assumes that "if I have access to a dozen different fonts, then why not use them?" The result is **often a bizarre combination** *of type that does more* to confuse the readers than to benefit them. (You can see what I mean.) **OR, IF THEY DON'T KNOW THAT AACHEN BOLD (OR A NUMBER OF OTHER FONTS) IS DESIGNED FOR DISPLAY TYPE AND NOT FOR BODY COPY, THEN YOU END UP WITH COPY THAT IS HARD TO READ.**

The same idea applies to video production. A relatively new development in the desktop video production industry is called the Video Toaster. This innovative piece of equipment has been touted as "unquestionably the computer phenomenon of the year in 1991" by *Discover Magazine.* And *PC Magazine* reported that the Toaster has "the same functionality as professional video editing and switching equipment that costs from 10 to 50 times the price." When unseasoned students get their hands on a computerized switcher that gives them a choice of over 40 different wipes, fades, dissolves, tumbles, twists, and turns between scenes in a video program, they are likely to try as many of them as possible, even when a simple cut is the conventional

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and most aesthetically pleasing way to make the transition. It is somewhat difficult to illustrate the idea in print, but imagine Dan Rather's talking head being stretched in grotesque proportions or being bounced off the four corners of the television screen before finally settling into normal position on the screen.

Admittedly, it is sometimes fun to experiment with such images, but it takes a certain amount of seasoned control that comes only through experience and study to make a truly professional-looking production. If it sounds like I am opposed to these new technologies, I am not at all. They make my job a great deal easier. My caution to the user is to take time to learn some old fashioned artistry while mastering new technologies.

While the use of new technologies in the classroom can present new challenges to the instructor, it also presents unprecedented opportunities to the students. In years past (and in many larger schools today) beginning students rarely had the opportunity to even touch the expensive equipment in a television studio or have any part in making the pages of a newspaper "camera ready." Today, even though the hands-on nature of my instruction allows and maybe even invites student errors, it also invites experimentation and exploration of new ideas and techniques that might be stifled in a more controlled situation. And one of the most satisfying aspects of the new "user friendly" technologies in instruction is that it is almost as easy to correct a mistake as it is to make one. Perhaps, if Lord Acton had had such powerful yet "friendly" tools at his disposal, he would have felt that power, while still corruptible, was at least corrigible.

Technology, Tenacity and the Nontraditional Student

Nancy M. Smith

The "Other Generation"

Much has been written about the "new generation" of high-tech whiz kids who puportedly have the edge on technology. Raised in an era of computer games and mechanical toys, they have grown up with little fear of the technical world in which they live.

But, what about the "older generation" which grew up without a computer in the classroom or even a hand-held calculator. How are they succeeding and adjusting to the ever-increasing influence of technology? What happens to the older or nontraditional students who choose to return to the classroom for technical training or retooling in a technology based profession? Do they have the "tenacity" to succeed and compete with the traditional college-age student? Are they successful in persisting, graduating and finding employment in a technical field?

Utah ranks third in the nation as a center for high technology, with only 25 percent of all high-tech firms having been in existence for more than 10 years. Is it just the traditional college-age student who will provide the trained work force for Utah's high-tech industry? Or are nontraditional college-age students also being trained?

The purpose of this paper is to discuss variables related to nontraditional student enrollment and success at Utah Valley Community College with particular emphasis on course taking patterns, employment while attending school, financial aid participation and career and social goals.

Cafeteria Encounter

Typically, most student enrollees on college campuses were 18- to 22-years old, but more recently the definition of a college student and what it means to go to college has changed dramatically.

My recent experience in the campus cafeteria reminded me that our campus is not the sole domain of the traditional college-age student. I was standing in line waiting to pay for a drink, when a gentleman in front of me began a conversation. I could tell by the books and backpack that the man was a student, so I asked my usual "student" question, "what are you studying?" His reply was anything but usual. He answered "life." I thought for a minute and asked, "are you minoring in anything?" "Oh that would be automotive technology. I retired from the military after 20 years as a technician and now I want to get a degree so I can teach." He told me his name was Steve and asked if I worked on campus. When I responded that I worked in Institutional Research he again surprised me by stating, "you must see a lot of nontraditional students like me."

When I returned to my office, I couldn't stop thinking about Steve. A number of things intrigued me. I had never heard a student refer to him or herself as nontraditional before, and this man did so with a sense of comfort and even pride. I was also intrigued by this student's confidence and excitement. I had no doubt that he was well on his way to achieving his professional and academic objectives at UVCC.

Teaching Nontraditional Students

Steve reminded me of the many nontraditional students who passed through my classroom when I taught in the business school. I can vividly recall

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the look of horror on the faces of 40-year old students who thought they had signed up for a typing class and entered a room full of computers. I would almost have to block the door to keep them in the classroom. Then I would spend an entire class period convincing them their keyboarding skills would transfer rapidly to the computer keyboard, and they could compete with the whiz kid who was sitting next to them and already had the computer up, running and doing tricks.

My teaching experiences with nontraditional adult students have always been very positive. These students seemed to be more directed, more on task and motivated and more likely to succeed. I began to wonder if my experiences and assumptions were reflective of all nontraditional students at UVCC.

While there are a number of articles and research studies that focus on the many *obstacles* and *problems* of nontraditional students who return to college, I could find nothing dealing with the *success* of nontraditional students.

Directing a campus Instutional Research Office has at least one advantage—access to data to answer research questions.

Are Nontraditional Students Succeeding?

With access to the appropriate data bases, I wanted to find out if nontraditional students who enrolled and attended classes at Utah Valley Community College were successful in achieving their ultimate career goals. I also wanted to know if nontraditional students actually are more likely to enroll in a technical field than traditional students. Other issues such as course taking patterns, career goals and objectives and involvement in campus life were of interest.

Enrollment in Technology Courses by Age

An analysis of our campus enrollment data for Fall 1991 shows that 71.43 percent of all technology students are nontraditional or over the age of 22, while only 39.76 percent of general studies students are over the age of 22. The data reveals a significant difference in the average age of technology and general studies students, and that older or nontraditional students are more likely to be enrolled in a technology than a general studies area.

Grade Achievement by Department and Age

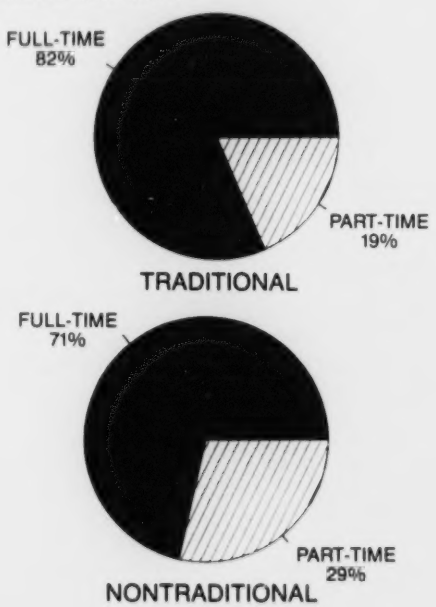
A review of the accumulative grade-point averages for traditional and nontraditional students also reveals some interesting patterns. In every school on campus, accumulative grade point average for nontraditional students was higher than for traditional students. The highest differential was shown to be in the trades area with almost one-half grade point difference between traditional and nontraditional students.

Fall Survey of Students

In the fall of each academic year the Institutional Research office conducts a survey of Entering and Continuing Students. The results from this survey were formatted by age categories according to traditional and nontraditional groups. A review of the data displayed in this manner revealed there are some significant differences in student enrollment patterns, academic and personal-development goals, financial-aid, and involvement and interest in social or cultural activities on campus.

Full-time vs. Part-time Enrollment

When a comparison was made of part-time and full-time students, the data shows that traditional students are more likely to be enrolled full time (82%, while only 72% of nontraditional students are enrolled full time.

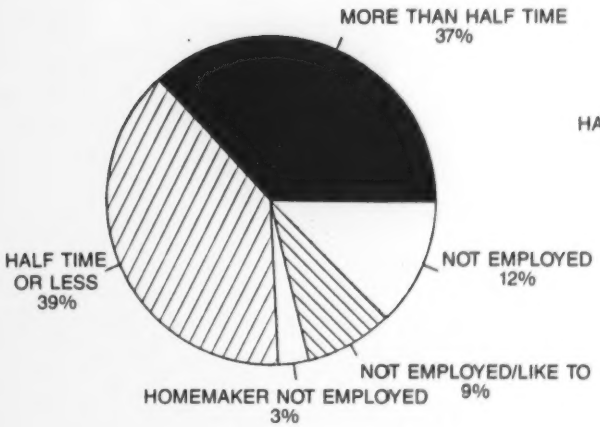


Employment Status

A review of employment status while enrolled in school shows that 37 percent of traditional students were employed more than half time, while 54 percent of nontraditional students worked more than half time while attending school.

Financial Aid

The percentage of students who receive or have applied for financial aid changes significantly by age. Slightly less than 50 percent of traditional students receive or apply for financial aid, while more than 69% of nontraditional students either receive or have applied for financial aid. The 19 percent differential is significant and represents one of the major obstacles facing nontraditional students.



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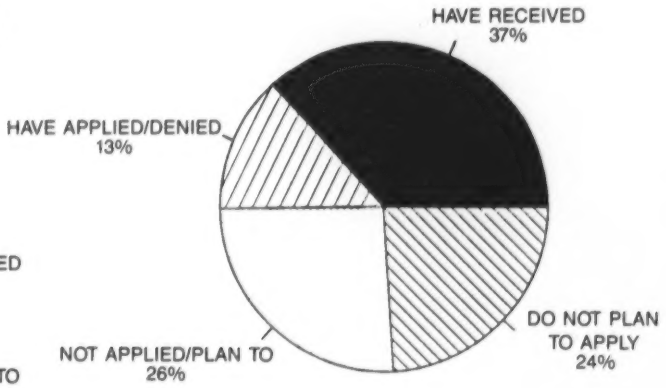

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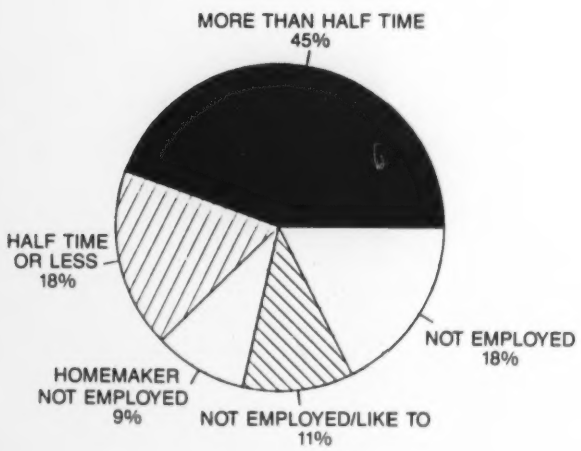

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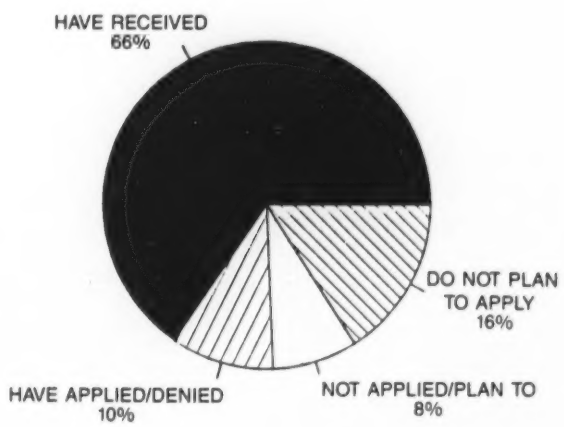
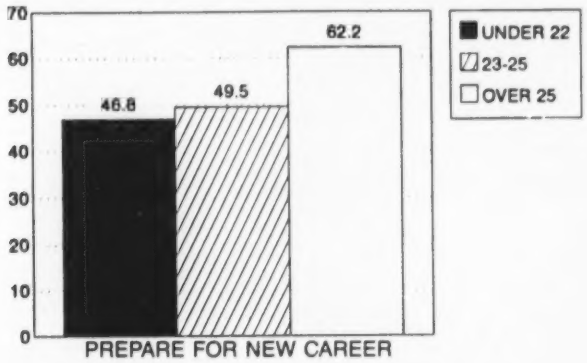


NONTRADITIONAL

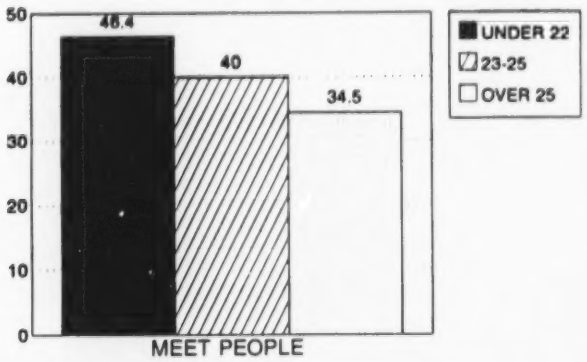
Career Preparation Goals

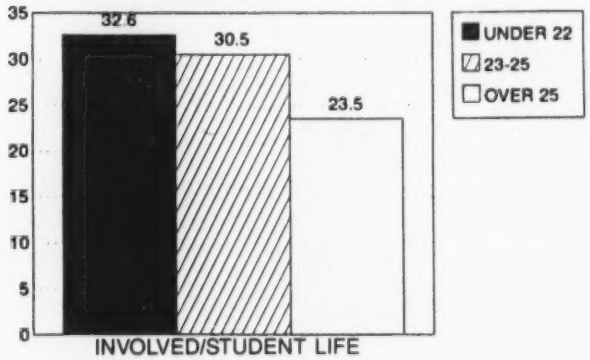
When entering and continuing students were asked to indicate their interest in preparing for a new career, as would be expected, 62.2 percent of students over 25 had such a goal, while only 46.8 percent of students under 22 responded in a like manner.

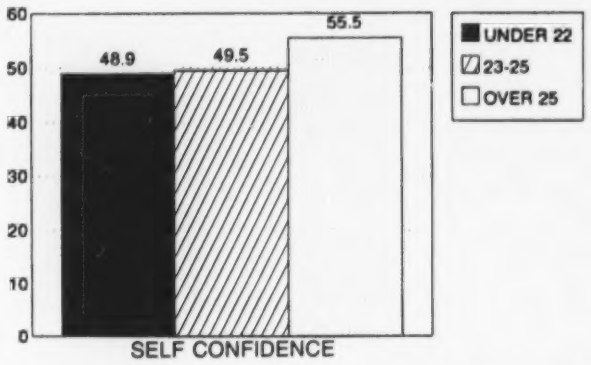


Social- or Cultural-Goals Importance

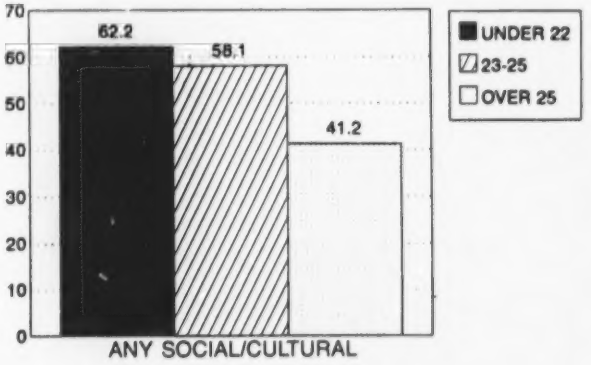
When traditional and nontraditional students were asked to rate the importance of meeting new people while attending college, nontraditional students were less likely to rate meeting new people as an important goal (34.5 percent for over 25 years of age, and 46.4 for under 22 years of age). (Figure 1) The same is true for involvement in social or cultural activities or student life. (Figures 2 and 3)







Interestingly enough, the inverse is true when students were asked to respond to the importance of gaining self-confidence. More than 55 percent of all students over 25 rated self-confidence as an important goal, with only 48.9 percent of traditional students attaching the same importance.



Conclusion

Nontraditional students offer the experiences of a lifetime and the optimism of youth as they face the challenges of higher education. Regardless of obstacles of employment, child rearing and lack of exposure to technology, through tenacity and commitment to lofty goals, the students are succeeding. Nontraditional students at UVCC are more likely to enroll in technology-based disciplines and achieve higher cumulative grade-point averages than traditional students.

Accessing the Inner Student: Preparing the ground to ensure students achieve their highest potential

Toni Pickall

Do we teach our subjects, or by means of our subjects do we teach our students? My position is that, yes, we want students to learn our given subject areas, but at the same time we have a larger reponsibility of awakening the inner student.

By creating the environment that engenders trust and thereby allows the student vulnerability and risk taking, the ground is readied to plant the seeds of learning. It takes a special kind of teacher to awaken the inner student—a teacher who can lead students to look at their mirror image so that they discover their highest potential. At times, the classroom environment can become more important than the subject being imparted. The self-discovery experience becomes a journey. The teacher who awakens the inner student is the one who can teach and at the same time help students discover their creative self and realize that excellence is not something achieved but something pursued.

I believe at the core of the inner student is the pusuit of excellence. Only the inner student is willing to embarce an attitude of quality choices and actions and to strive to make "today's maximum tomorrow's minimum." That highest potential in the student is inspired by a vision to drive, to raise sights, and to elevate standards of quality. However, this isn't necessarily the student that we see sitting before us.

Infertile Ground

In the classroom the teacher is faced with different types of soil in which to plant the seeds of learning. Unfortunately, the ground is not always fertile and the teacher has to plant seeds on the stony and throny soil as well as on the wayside. The ideal student who hears, understands, integrates and is able to use the information can be likened to the fertile ground. But what about the seeds planted on stony ground—those students who aren't committed or those students who become initially excited, do well on first assignments and quizzes but have no follow through? How viable will the seeds planted on the thorny soil be—those students who hear but are unable to comprehend because their minds are being choked by distractions and a lack of focus?

The greatest challenge are those students who get lost by the wayside, students who come to class unprepared, with no desire or motivation—they hear, but they just don't care. Often they have great potential that has not been tapped.

Most teaching is designed to involve the mind instead of the whole person. The student's emotional needs, which can interfere with learning comprehension, are often left for the student to deal with and are often ignored in setting up the classroom environment.

Student Blocks

Students come equipped with blocks. Blocks are preconceived fixed beliefs that prevent students from expanding to reach their highest potential. These students are "okay" to stay within their comfort zones and replay their inner tapes that say: "I don't know what's right or wrong, I can't do it, I'm not good enough, I've never done this before." The fear the unknown worlds of creativity and resourcefulness.

A cross section of students sit in the classroom, wide-eyed, seemingly attentive while behind their masks of "everything's cool" are all these self-defeating agendas rattling in their minds. How can they be totally present to receive the "gems" that are being offered to them? How can they be free

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to take a stand, think critically, and express their informed opinions?

Perhaps everything we needed to learn we did learn in kindergarten. Higher education, among several things, is a process of "tearing down the walls" and letting go of paradigms. In letting paradigms go, we wake up to the realization that much of how we process information is dictated by defending our fixed beliefs. We wake up to our responses to extrinsic influences, whether they be: conforming to the status quo, falling victim to statistical averages, buying into outdated traditions, operating merely out of habit, or justifying on the basis that "everybody else is doing it."

Teachers have a responsibility to transcend subject matter and create an environment (soil preparation) where students feel open and willing, take risks, and are creative—an environment where we can assist them to get past "student blocks." Over the years of teaching, I have identified the following blocks:

Fear of failure: In this block, the self is not allowed to take risks. As a result there is a tendency to settle for less in an effort to avoid the possibility of failing.

Fear of play: Having been conditioned to a serious problem-solving style, the student is unable to experiment with new ways of seeing and doing things. In defending, appearing to seem foolish or silly in others' eyes, creativity is held back. Students will always resist unless they learn to accept insecurity as the bridge to cross the stream of uncertainty into the valley of success.

Fear of judgment: The student tends not to honor the creative self or inner student. There is a tendency to compromise the pursuit of excellence because being right or wrong is more important.

Fear of guilt: The student allows a network of rules spoken by others that are held in their mind as "shoulds" and "should nots" to influence their choices. There is an inability to let the internal dialogue go. Only when the mind stops talking do they have a chance to open up and become receptive to what is happening around them. When the mind is open, then the student is ready to receive information.

Frustration avoidance: The student often gives up too soon, especially when faced with obstacles. It is easier to stay in the comfort zone than to risk the discomfort that comes with change.

Reluctance to exert influence: There is a hesitancy to stand up for what one believes or thinks. This block can cause any interactive approach to go flat.

Over-certain: There is a syndrome called "I dare you to teach me anything I don't already know." The student's mind is closed and unable to hear and process information from a mind-set of: "How can I use this? How can I do this differently? How can I be different?"

Custom bound: The student is locked into traditional ways to a point where she or he conforms even when it is not necessary or useful. The student does not recognize that the mind can become trapped in routine patterns and that learning takes place primarily when crossing paradigms and expanding from her or his comfort zone.

Teacher pleaser: In the classroom, the concept of win-lose is so ingrained that students choose to compromise by not disagreeing, questioning, or responding other than regurgitating what they think the teacher wants to hear.

If the instructor-mentors of the 90's want to have students develop their potential of excellence, they will have to prepare the soil to ensure that students achieve their highest potential. The irony of identifying student blocks (and this rang true for me) is first to recognize the blocks and then face them ourselves. Only then is the instructor-mentor able to mirror the attributes in the classroom. If the environment of the classroom is to encourage the highest value as excellence, then both student and teacher will have to make appropriate choices and behaviors to support it.

Implementing Technology Assisted Instruction in the Classroom

Richard C. Darnell

Over the last decade, the high-tech environment that has become common in business and industry, for better or worse, has also invaded the classroom at all levels. The days of lectures supplemented with chalkboard and chalk and an occasional transparency are numbered, if not virtually over. The classroom of today should, and certainly the classroom of the future will, contain multimedia, student interactive response and integrated record keeping. While the implications of what can be accomplished using technological bells and whistles are exciting and stimulating, these innovations also create challenges for administrators, faculty and students. We must ask ourselves if teaching is really improved and if students actually benefit from the electronic sorcery that can be brought into todays classroom. Is it really worth the cost and energy required to implement it?

The following quotation from Training Magazine offers insight:

> "Anyone developing presentations for today's workplace audiences has to face one inescapable fact: The American population has changed from verbally literate to visually literate. Where two generations ago, people obtained most of their information through reading, today they get it from visual images, primarily televison. Where in 1960 you could pique an audiences's attention solely with good writing, today you must do it with the same sophisticated visual techniques they've come to expect from prime time and the silver screen . . . Good visuals not only support good content, they become good content as measured by the only critics that really matter—the people you're trying to train."

Harold M. Horowitz, Ph.D, Program Director of Educational Technology for IBM Corporation, described the Advanced Technology Classroom at the IBM Corporation Management Development Center and the application of interactive student response units. Results from traditional vs. technology enhanced classrooms in management training courses were compared. Improvements found using the technology enhanced classroom over the traditional classroom were:

- A 77 percent increase in student attentiveness
- A 27 percent increase in average test scores.
- More productive use of classroom time.
- An increase of 20-30 percent more learning points in the allocated time.

The Technology Enhanced Classroom

The goal of technology assisted instruction, is to improve retention and the depth and breadth of learning by:

- Providing a classroom rich in visual imagery.
- Supporting the instructor with powerful tools to enhance student information retention.
- Faciliating active learner participation in the instructional process.

Our challenge then is to identify and define what technological tools work well in the classroom to provide cost effective support of instruction. There

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are currently so many manufacturers and vendors of hardware, software and courseware that it is difficult not to become confused about how they work together (or if they work together at all), compare features and evaluate comparative costs. How can we avoid confusion when trying to decide which systems and features are important when the language and jargon used to describe these features often sounds foreign and is confusing in itself?

Obviously, it is necessary for those responsible for selecting hardware and software systems to support technology assisted instruction to educate themselves with the basic fundmentals of the use of computers and sophisticated multimedia development and delivery systems. But the most important requirement in defining a well-designed delivery system is to first define how the system is to be used and what it is supposed to accomplish.

The first step in defining a system configuration is to determine whether it is to be used for individualized instruction, group instruction or a combination of the two. Each of these formats has its advantages and disadvantages.

Individualized Instruction

The individualized instructional format typically is a computer lab environment where many students working independently at different levels or points in the program are loosely supervised by an instructor/facilitator. The following characteristics are typical of the individualized format:

- One computer for each student or time sharing between students.
- Low student/instructor ratio for most effective results.
- There is often difficulty in keeping students on task.
- Students are isolated.
- Students need to be self motivated.
- Students need to be self disciplined.
- The cost of courseware development is high.

Individualized instruction seems to work best for the following applications:

- Material requiring repetitive reinforcement.
- As a supplement to group instruction.
- For highly motivated, self disciplined students.

Group Instruction

Group instruction consists of some kind of lecture format supported by multimedia and interactive response systems. The instructor is in complete control and able to monitor individuals as well as the group at all times. The following are typical characteristics of the group format in a technology enhanced classroom.

- One computer for a classroom of students.
- Instructor initiated responses keep students on task.
- Higher student/instructor ratio is possible than with individualized instruction.
- Peer pressure and class dynamics promote maintenance of attention.
- Student camaraderie and team effort is developed.
- Courseware is less expensive to develop.

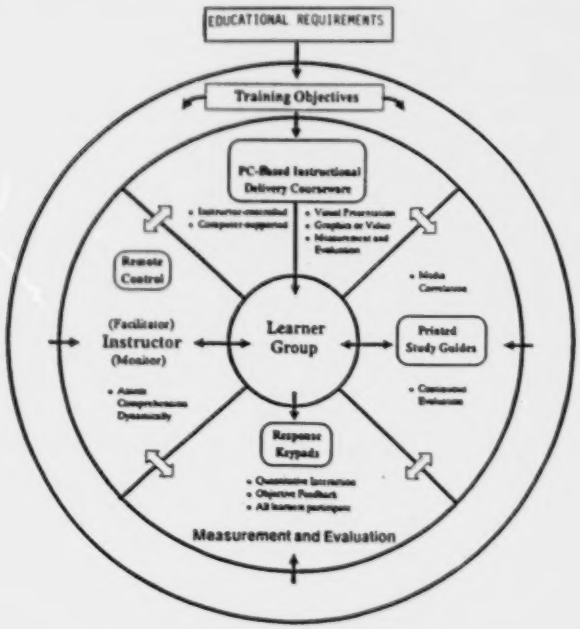
Today 80-90 percent of instruction takes place in some kind of group format. It is expected that this will continue at least through the next decade. Group instruction seems to be the superior mode for most students if it is supported with multimedia and interactive student response capability. Individualized instruction is used to support the group instruction and for special applications. Both individualized and group formats are most effective when the courseware is also supported with a handout of "text notes" that contains key information and exercises. The text notes are in the same sequence as the presentation of the course material and generally keyed to the text book being used.

Technology Assisted Classroom Model

A technology assisted classroom model should consist of the following: Educational requirements for the course/program are researched and defined in general. From these requirements, specific training objectives are identified and defined. Using the instructional delivery courseware, the instructor delivers the group lecture, supported by the computer generated remotely controlled multimedia system. The entire presentation is under instructor control. In this sense the instructor acts as a facilitator.

Measurement and evaluation are accomplished via wireless student response pads which allow the instructor to dynamically assess student comprehension. The objective feedback provides quantative interaction in which all learners participate.

Printed text notes or study guides keyed to the group presentations are provided to correlate the media and presentations and support out of class homework and allow the students to review material on an individualized basis.



TECHNOLOGY ASSISTED CLASSROOM MODEL

Implementation in the Classroom

In order to implement technology assisted instruction into the classroom, a systematic process should be followed to assure that the best instructional formats and most cost effective selections are made. The evaluation should begin with the following key steps:

- Define the educational objectives to be satisfied with the proposed system.
- Define the curricula required to meet the educaitonal objectives.
- Research and define the possible methods of educational delivery.
- Define the training required to use the delivery systems.
- Determine whether an individualized group or hybrid format will be used. Generally we would recommend a hybrid format containing both group and individualized components to provide the greatest flexibility.

Key Considerations

Once the basic instruction objectives and delivery have been defined, the following key considerations should be evaluated:

- Will a room be used that is dedicated only to this instructional format with the equipment permanently installed?
- Must any or all of the equipment be portable?
- Is there satisfactory depth and breadth of courseware currently available or under development?
- Are authoring systems available to develop your own courseware or customize existing courseware to meet your needs?
- Can the system be used univerally throughout the institution?

Selection Process

After the requirements have been identified and the system to meet those requirements has been defined, care should be taken in selecting the hardware, software and courseware components to make the system work as intended. This part of the evaluation needs:

- A systematic approach.
- A consideration of all needs.
- A ranking of all needs.
- A comparison of the available options ability to meet the defined needs.

An effective approach used in our department is the selection matrix. We find that this process works well for any departmental decision we have to make, particularly where a group consensus must be reached. An example matrix tailored to select a piece of equipment from six vendors is shown below. All of the attributes that are important to the selection are agreed upon by the group making the selection and listed in the attribute column. Each attribute is then given a percentage weight so that the total equals 100. In our department, if a group

is making the decision we have each member assign weights independently and then take the average for the final evaluation document.

After the weighted attributes are agreed upon, the equipment provided by each vendor is scored independently by each member of the selection committee. Each attribute cannot be scored higher than the agreed on weight. The inputs from each committee member are then averaged on a composite matrix. Even though some members may have justified or unjustified biases our experience is that the composite provides a very objective profile of each option when compared to the others and the best choices do stand out.

Clearly, in this example vendor 3 is the best choice. Vendors 2 and 5 might be viable alternatives. We have also met the four requirements of providing a systematic approach, a consideration of all needs, a ranking of all needs and a comparison of the available options' ability to meet the defined needs.

SELECTION MATRIX

ATTRIBUTE	WEIGHT	VENDOR/MODEL SCORE					
		1	2	3	4	5	6
Warranty	5	1	3	5	4	3	4
Portability	10	8	10	9	7	6	7
Ease of operation	25	16	20	25	15	18	13
Cost/value ratio	30	22	19	27	20	25	21
Feature 1	10	5	6	8	10	9	8
Feature 2	5	5	4	5	4	3	4
Feature 3	15	10	9	12	8	11	9
TOTAL POINTS	**100**	**67**	**71**	**91**	**68**	**75**	**56**

Implementation at SLCC

One year ago the electronics department purchased two computer controlled instructional delivery systems with the associated courseware from Hyper Graphics Corporation of Dallas to be used in our first year electronics courses. The systems include interactive student response capability, group and individualized instructional options and built-in scoring and record keeping features. We have found that where these techniques are being used, our experience parallels the results of the studies cited in this article. Students are very positive about using the Hyper Graphics format and indicate overwhelmingly that they would like to see more instruction delivered in this format. We have noted positive changes in the personality of entire classes when using technology assisted instruction and significant improvement in student performance.

Our experience with instructors is mixed. Some are excited and like using it and are currently doing some independent development of their own. Others seem intimidated by it and are resisting full implementation. One factor that stands out is that the effectiveness of the system is closely related to the skill of the instructor in using it; therefore, it is critical that training be provided with the implementation of this kind of system. Also, because of the implementation cost involved, all faculty in each instructional area must be committed to its use to fully exploit its potential and realize the greatest benefit from the investment.

Since decisions associated with the design and implementation of instructional technology can be very complex and expensive, at Salt Lake Community College we have formed a college-wide committe of faculty and staff who have expertise or are interested in the application of this tech-

nology. We are currently developing and recommending policies for systematizing the design and implementation of instructional technology at our institution. We feel that an institutional-wide approach will result in the most cost effective implementation strategy by eliminating unnecessary duplication and targeting a cadre of "in-house experts" to assist individuals and departments in selecting equipment and formats in their instructional areas.

Summary

While we can expect the technology invasion of the classroom to continue and even accelerate, it is important to emphasize the individual instructor still remains the key component in any instructional system. No electronic system or software program can replace an instructor's ability to motivate and direct, or equal the enthusiasm that instructors have for their subjects, or replace the judgment, compassion and creativity that instructors have in working with their students as individuals. Technology is not an invasion of the classroom but a welcome ally who has come to support the efforts of dedicated teachers.

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Mathematics and the Graphing Calculator

Scott L. Mortensen

When mathematicians think of technology in the classroom they always think of how calculators and computers will enhance a student's ability to solve problems and their understanding of the mathematics. Schools are increasingly using technology for instruction. The NCTM assumes that in grades 9–12 all students will have access to a graphing calculator. They should be used routinely. I feel strongly that this must be taken seriously. The need for rote, mechanical manipulation of mathematical concepts, whether it be in arithmetic in the advanced algebras and even calculus, is being made nearly obsolete by new technology. With the surge of new technology educators need to show students not only how the machine works, but how to apply it in the various subjects that they will be dealing with throughout their education. Because of the new technology, we must learn to expect more from our students. We can do away with the "busywork" and ask our students to set up the problems rather than taking all of their time manipulating concepts. Technology can help our students think more deeply about mathematical problems and assist them in solving difficult problems.

Costs

Graphing calculators are becoming more inexpensive and are more of a pocket computer than just a calculator. The cost of these calculators is approaching the cost of a mathematics textbook and can be used throughout many of the student's college math and science classes. Parents, when they see the edge that their child will gain from the use of a graphing calculator, are more willing to make the purchase a priority. Computers are an important tool, but for the cost of a computer and a projection device, a classroom could have a whole set of pocket computers. To save money, students can pair up on the purchase of a calculator and this in itself enhances the communication that should exist in every mathematics classroom.

Teachers must be ready to accept the new technology. We must not be intimidated by this new teaching tool. We must be willing to let loose of our familiar ways and experiment with the new. It will change the way we teach. Visualization will help our students see math! Emphasis on exact answers will be lessened. Estimation will take the forefront and rightfully so. Technology is here to stay! "The teacher's ability to use the technology, convince and aid students to use it, will enhance crucial skills needed to meet the demands of society. Computer and calculator based technology can turn the mathematics classroom into a mathematics laboratory" *Demana, Walts, Embse, Foley* (1991). A hands on experiment! Workshops are being offered more in all areas of the nation to aid teachers in using this technology. So excuses for teachers are non-existent.

Uses

Uses of the graphing calculator vary greatly. A problem such as $x^2 = 2^x$, for example, could be a very difficult problem. But with the graphing calculator this becomes quite simple. Most calculus extremum problems can be easily solved using the zoom-in feature built into the calculator. One of the ideal capabilities of the calculator is to assist in finding rational roots of polynomials. This is a difficult process and one does not look forward to solving such problems. But with this machine one can easily estimate which of the roots are possibilities and then check to see if the roots do solve the problem. Such an approach puts the focus on the mathematics without using valuable time in mathematics classes for a study of computer programming while achieving basically the same results.

Another difficult idea to show students is that of domain and range of both inequalities and equations. A student needs to understand that the graph of an equation or function is no more than plotting all the points that solve the given function. When

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the graphing calculator is used the students can see that a function is not just some numbers and variables, but a 'picture'. Seeing a 'picture' of the function helps the student visualize that the set of all x's makes up the domain of a function and the set of all y's makes up the range of the function. The teacher can use different views of the function to show that the domain and range can go on forever or may stop at a certain point. This will also limit errors made in viewing only one picture. Vertical and horizontal asymtopes can be easily seen on the 'picture' of the graph. Showing 'pictures' of product and quotient inequalities, the student can see the meaning of greater or less than zero, simply the part of the graph which is above or below the x-axis. Through all this the students need to be aware of the pitfalls of the graph and use the graphical answers to 'plug back in' to the equation and solve algebraically. When a calculator based teaching technique is used, this permits geometric representations to be integrated with algebra to promote deeper insight and understanding about mathematics.

The idea of functions is often a diccult one for students to grasp. By analyzing numerous graphs of functions in a short period of time, students are able to build strong intuition and understanding about functions. One must always bear in mind that computer graphing does not remove the need for students to think about mathematics. Quite the contrary—it can serve to motivate and enable students to think about more mathematics!

We have discussed ideas to use the graphing calculator in advanced classes, but their use does not need to be for those courses only. Key concepts of algebra and numerical investigation of problem scenarios can be made accessible to beginning students. The traditional approaches should not be used on college students again, much the same as in K-12. I have found that giving calculators to students in general math classes reduces math anxiety, allowing them to learn better. Calculators seem to give the students the confidence they need to solve more realistic problems. Graphing calculators permit the early introduction of graphing. The traditional way of graphing by plotting many, many points is drudgery to most students. This can be eliminated by the use of a calculator. Two-year college faculty can provide an effective laboratory for seeing new approahces that will enable more students to learn mathematics.

I am a strong advocate of the use of calculators and use them in all my classes from general math up through calculus. I am always interested in the new calculators coming out and how they can be used in my classroom. Some experts who promote the use of calculators in the classroom express my feelings very well, as quoted below:

"We must help students meet the challenges of lifelong learning that surely lie ahead. They must be trained as flexible problem solvers, capable of understanding and employing technological advances as they occur. This generation of students will soon hold the power of today's main-frame computers in their hands" *Franklin Demana and Bert K. Walts* (1990).

"We need to let machines do the mental work of computation—tasks that calculators and computers can do with great speed and accuracy—and concentrate on developing the human reasoning skills required to take full advantage of technology. Future historians will undoubtably shake their heads and wonder why the 'vast majority of mathematics teachers have failed to respond effectively to the possibilities opened up by this new technology'" *Nancy Harlow Pejouhy* (1990).

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Diversity Through a Core Approach to Ethics

Elaine Eliason Englehardt

Ethics became an educational catch-word in the late 80's and early '90's as discussion circulated nationally on ethics as a curricular reform project at colleges and universities. At Utah Valley Community College developing and adding a core of ethics to the curriculum has been one of the most uniting, strengthening and educationally rigorous moves we have made. Why? Because it fits—it fits as a humanities core, as a requirement for business students, as a vital focus in the nursing program and as a necessary enrichment for trade and technology courses. This one course gives UVCC students understanding and confidence in analyzing and debating moral issues. These exciting debates can be heard through the halls, in study areas, even in the cafeteria. The ingredients built into this program make it an exciting course to teach, take and further strengthen.

A Curriculum Staple

Ethics became a curriculum staple at UVCC in 1987. After two years of pondering, discussing and debating how the humanities curriculum could be enriched at Utah Valley Community College, the Humanities faculty determined that we would offer a core course. We knew this would negatively impact the enrollment in some of our humanities courses, yet we believed it was important that all students be thoroughly exposed to humanities through an interdisciplinary ethics and values course. Using the disciplines of philosophy, religion, literature and history, we designed a course that over 2,000 students per year would take. We then turned to National Endowment for the Humanities, (NEH) for help in teaching this class on a level of national rigor. Just as we were pilot teaching this course in 1987, we received a three-year NEH grant for approximately $115,000. The grant included faculty summer seminars with scholars of national reputation, community lecture series, quarterly visits from scholars both in-state and out-of-state quarterly, and library acquisitions. All of these activities took place during the three years of the grant, and continue today.

The faculty, college, students, community and NEH have deemed this class and program as exceptional. Yet, there were times when we wondered if we would offend the community, have courses filled with bored students, and find that our venture into curricular reform was a fiasco. The overwhelming success of the program in the ensuing years has put those fears to rest. Let me confess and share the path we took in implementing this new curriculum.

Thinking Critically

The course was organized to help students understand the humanities as well as the specific realm of ethics. The purpose of the class was not to teach students a specific skill, but rather to help them be individuals of a distinctive kind—who think critically, who know how to evaluate problems, who discuss issues civilly, who communicate well orally and in writing, and who care about and strive to do what is morally right. These abilities and developed characteristics compose, we believe, much of the goal of teaching and learning in the humanities.

The Ethics and Values course has the focus of helping students evaluate the numerous complications inherent in the study of ethics. We do this through a selection of primary works, anthologized texts and supplemental interdisciplinary works. This combination is designed to provide an in-depth survey of ethics.

We designed this course keeping several national trends in focus. **First,** the discussion of ethics is timely. The complexities of various ethical situations are fervently discussed throughout the world.

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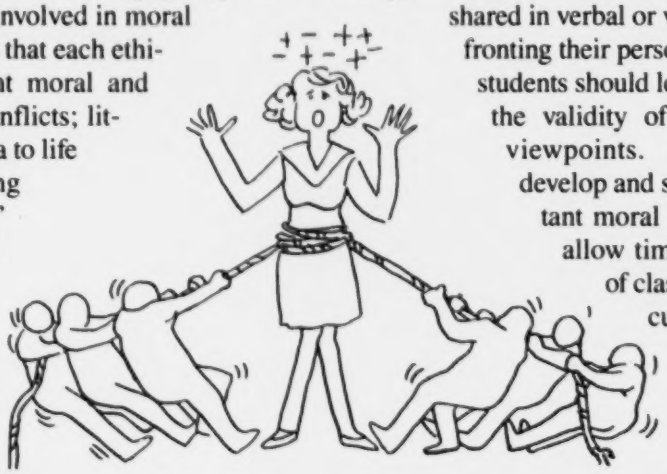
It is important students have a forum to learn of the foundations of ethics as well as others' morals, values and ideals. Well-educated students should know the seminal works in ethics and understand the various approaches to dilemmas. This could be called gaining an ethical literacy.

Second, we strongly encourage interdisciplinary study. Each of the issues we study is presented with readings in the areas of philosophy, literature, religion and history. A new perspective on the issue often unfolds with each discipline; sometimes these perspectives conflict with one another. An inquiry into a different dimension of a subject can be painful for a student, but we see studying and understanding differences as a healthy part of the learning process. These four disciplines are particularly helpful in the study of ethics. Philosophy helps us discern the complexities involved in moral ideas; religion reminds us that each ethical dilemma has inherent moral and value implications and conflicts; literature brings the dilemma to life with characters moving through "right and wrong" decisions and living with the consequences of their choices; history is helpful in that it infuses the values of a different time and culture with our own. It can make students aware that an unquestionable assumption today was seen quite differently at another time.



The **third** national trend we use as a focus is the inclusion of a strong writing component. Students' understanding and appreciation of a subject increase as they put their thoughts into written form. My students and I often discuss desirable paper topics and how these are formulated into a strong paper. My best formula is that the students must use two foundational sources for their paper, and only two sources. They are to weave these sources into an argument that they develop either on theory or applied ethics. Out of the three, three-to-six page papers required, the students write one on theory, one on applied ethics, and one on a classic novel from a reading list. Also as a writing requirement, students must keep a journal. Every week they are to select an article from a newspaper or magazine. They are then to examine thoroughly the ethical implications of this article, concluding with what they believe their choice would be were they in this situtation. I do not grade on grammar or spelling, only content. I want the students to analytically and critically develop journal entries. Sometimes this is a confusing and distressing exercise for the students, particularly when they learn that there are few simple answers to complex ethical dilemmas.

Fourth, self-confrontation and verbal discussion should be encouraged. Students can often see mistakes or truth in their own reasoning when expressing ideas aloud. We work from the theory that a thought or idea is not verifiable until it has been shared in verbal or written form. By confronting their personal moral reasoning, students should learn tolerance toward the validity of other's values and viewpoints. They should also develop and share ideas on important moral topics. Our teachers allow time inside and outside of class, for students to discuss ethical issues and perspectives.

Critical thinking is the **fifth** national perspective. Students should be encouraged to understand that the ethical approaches found in this class are legitimate parts of a cultural heritage, but each of them can and often do conflict with others in certain respects. Critical thinking should be applied as students work through the course. They should determine the perspectives of the writers, for such understanding will shape the analysis of and recommended responses to ethical dilemmas. Students should also confront the question of why they are inclined to one ethical system over another. Why does one author or philosopher appeal to them over others? Are their choices explained merely by what their parents, their peers, or their religious communities believe? Or are their choices the result of independent

judgments that respect the moral views of others—including their parents, peers and clergy—but are ultimately formed autonomously and with a full sense of personal accountability? In short, the students should examine critically the grounding of their ethical points of view. Are they really capable of publicly justifying their ethical positions, both those they might hold in an academic sense and those they live by? Critical thinking is an integral part of the writing and discussion process. It should help push students not only to think carefully about ethical matters, but also to live lives reflecting well-considered moral behavior.

The Nuts and Bolts

So, how does this course begin and end? I had that same question as I began teaching the pilot section of this class. I relaxed when I received the following comforting advice from a friend, Bill Newell who teaches in the interdisciplinary studies program at Miami University in Oxford, Ohio. He said:

> Fear is a natural accompaniment to new interdisciplinary courses. I was afraid every time I walked into class for at least the first four years of this program! Students expect faculty to have mastered their subject, and that's simply impossible in new courses drawing on intellectual traditions outside their own. I preached the virtues of co-learning, of searching for insight instead of having faculty spoon-feed it; and I made the case that interesting questions do not have neat answers. Still the students expected me to have control over the situation if not over the subject, and I never really felt in command. The moral? Don't feel inadequate if you know you are inadequately prepared, and if you feel afraid as a consequence.
>
> Your first obligation to your students is to develop the kind of course that will present them with issues that expand their minds, their sensitivites and their intellectual horizons. Your second is to create a classroom environment that encourages intellectual and personal engagement with those issues. Teaching them content is strictly tertiary, and two out of three ain't bad . . . If that doesn't work, try telling yourself you only grow through taking risks, try telling yourself that you'll have much more control over the course next time around, try buying yourself a new dress after a particularly trying day. Anything but blame yourself for doing what you believe is right instead of what is safe, easy and familiar. Now get out on that field. . . .

I have to smile as I reread Bill's advice. I had several concerns besides content before I went into the classroom. The first was how to contend with half the baseball team (I called them "the pack") who were all seated on the back row of the class and didn't think it was cool to participate. I solved that problem by dividing them among the rest of the class and focusing on some small group, collaborative learning. Another concern centered around the unity of belief in our area. Provo, Utah is situated in a community that is 85 percent Mormon—Church of Jesus Christ of Latter-day Saints. I believe one of the reasons NEH funded this project was our argument that our students in particular needed exposure to diverse opinions, ideologies, philosophies, theories and tenants. I was worried students and parents may object to discussing numerous viewpoints on issues such as abortion, euthanasia, capital punishment, sexual morality, war and evolution. Now, five years later, I can proudly say that I have never had one student or parent object to the content of the course. We don't try to change our students' ethics; we want them to understand their moral reasoning and take responsibility for their choices. They must also understand the implications of their choices. As faculty we rarely confess our ethical stand. We don't want to be seen as standing on the pedestal of knowledge dishing out the "right" system of ethics. We want students to understand how complicated each ethical dilemma is and understand that there are various factors influencing their decisions. On occasion I tease my students by saying, "Some of you act one way in Utah, but the minute you cross the state line into Nevada, you change into someone else." At first they laugh, but then we discuss taking responsibility for all our actions at all times, not just because someone may be watching. Actions and judgements should be an informed responsibility and students should always be able to rationally and logically back up their behavior and attitudes. I must also admit that our students are

much more diverse than I had expected. Almost every class period is filled with rousing debate and discussion.

Course Content

Now back to the actual content of the course. It begins with introductory books and essays on the nature of ethics. The first weeks of the course are designed to acquaint the students with ethical theory through the works of selected philosophers and religious writings. We firmly believe that we must establish a strong foundation in ethics before we delve into applied issues. A major goal of the faculty is that this course will not be akin to a " '60's rap session," where students rely only on previous knowledge. To help facilitate this foundation, we primarily focus on five ethical traditions: duties, rights, utility, and virtue. We also discuss an emerging ethics based on care. The writings from the Ten Commandments, the Sermon on the Mount and Immanuel Kant provide varying accounts of an ethic of duty. Thomas Hobbes's ethical approach is naturalistically based, but it also establishes the rudiments of an ethic of rights. The principle of utility is presented through writings from John Stuart Mill. Readings from Aristotle and Plato introduce the student to the notion of ethics as virtue. And, the ethic based on care, is developed through articles by Carol Gilligan and Allison Jaggar.

These can be heavy readings for Sophomore level students. I believe that collaborative learning can be used to facilitate these readings. On the second day of class, I divide the students into groups, each composed of six students. The students are required to meet once each week for at least an hour to discuss, explain and help each other with the readings and papers. They even get points for attending these meetings. At first they complain about the groups. They say they don't have time to meet because of family, jobs, athletics, etc. However, after about two weeks they become bonded as a group. Many even adopt names or slogans, such as "Aristotle Rules in Group Two." The students like the groups because they have a chance to discuss more openly the issues we have been developing in class. A student of mine, Matt had the following to say about his group:

> I was playing baseball and I just didn't think I had time to get together with my group. I went anyway and found I didn't want to miss a session. Some days I had left class confused or frustrated. In groups we could discuss the confusing points as well as throw around controversial ideas. We could then bring these points back to class and feel more comfortable discussing them. The groups were an outstanding extension of the class. I think I have made some friends for life in my group.

Utah Valley Community College is a commuter campus. Many of our students drive to campus for one or two courses and leave. By meeting in groups, the students usually make friends and find themselves more adaptable to understanding the diverse viewpoints and feelings of other students.

The rest of the course involves discussing issues in an interdisciplinary fashion. We often begin witht he topic of sexual morality, followed by abortion. Other popular issues among the teachers include war and nuclear war, the social responsibility of business, euthanasia, pornography and capital punishment. It is easy to find an anthology filled with the philosophical and sometimes religious perspectives on these issues. It is then important for the faculty to supplement these articles with books, or articles from the disciplines of literature and history.

Resources

Let me share a few of my favorite resources in literature and history. When discussing abortion, Ernest Hemingway's short story, "Hills Like White Elephants," is very effective, as is A.J. Cronin's story, "Doctor, I can't, I won't have a baby." Historical perspective is enhanced by readings from Linda Gordon's book, *A Social History of Birth Control*. Michael J. Gorman's book, *Abortion and the Early Church*, is also helpful.

The issue of war can be discussed through essays such as Mark Twain's "War Prayer," Lewis Thomas' "Late Night Thoughts on Listening to Mahler's Ninth Symphony," and Czeslaw Milosz's

"American Ignorance of War." Historical supplements can include works by Marion Yass such as *Hiroshima*, or Ardth Osada's work, *Children of Hiroshima*.

Researching topics for interdisciplinarity is interesting and invigorating. Interdisciplinarity is also a necessary part of this class. When reforming our curriculum, the humanities faculty discussed that too often in our classes we throw out information to our students like brightly colored bits of confetti. We don't tell students how this information links to other disciplines or how all learning is interconnected. Too often we act as if disciplines were created by a supreme being, and that we can not cross lines between them. The Ethics and Values class proves this outdated notion false. The student evaluations on this course are exceptional. Many students say it is the most important and most enjoyable class they have taken in college. The majority of the students understand that the learning process was enhanced and eased by using more than one discipline for the teaching of ethics.

Even though our funding with NEH expired two years ago, UVCC's administration has actively supported the enrichment of this course. For the past year and a half, the President of our College, Dr. Kerry Romesburg has been co-teaching the honors section of the class. Romesburg relates that it is an outstanding personal and professional experience. His administrative responsibilities are massive, yet he is willing to give at least 10 hours each week to the ethics course and students. His teaching evaluations from the students are exceptionally high. The Vice President of the College, Dr. Lucille Stoddard believes it is essential to continue the faculty study and continues to fund the summer seminars. We still bring in a scholar of national reputation to study with the faculty, who receive stipends for participation in the seminar. Last summer our topics centered around the themes of theism, atheism, existentialism and the philosophy of scientific thought. Our scholars were Dr. James Sterba and Dr. Janet Kourany from Notre Dame University. The scholarship, however, does not end with the summer seminar. All faculty teaching this course meet each Monday for an hour to further enrich their base of information. On a rotating basis individual faculty take responsibility for presenting a work or explaining an author. The college also sponsors an ethics debate or lecture every quarter for the students, community and college staff. These well-attended events cover a series of topics such as the environment, corporate responsibility, war, and even ethics surrounding earthquakes!

Core study in ethics has benefited the UVCC community for the past five years. Its spill-over effects can be seen in numerous classes and programs. This demanding course and accompanying program has enhanced the rigor of our curriculum. It fits well with our educational reform.

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CALL FOR PAPERS 1993

Faculty of Utah community colleges are invited to submit articles for inclusion in FOCUS, an annual forum on teaching and learning in Utah two-year institutions of higher education. The Editorial Board will also consider articles submitted by administrators, staff, students, and others addressing topics of interest to Utah community colleges.

Subject: Manuscripts may deal with curriculum, theory, research, teaching strategies, instructional models, student issues, faculty concerns, advocacy, governance, or any matters pertinent to Utah community colleges.

Format: Manuscripts should be typed, double spaced, and concisely written in about 2,000 to 3,000 words or less. **They must be submitted with hard copy and floppy disk in standard word processing format.**

Deadline: Manuscripts are Due April 2, 1993 to the campus Editorial Board representative and April 16, 1993 to the Editor in the Commissioner's Office, 3 Triad Center, Suite 550, Salt Lake City, Utah 84180-1205.

Review of Articles: The Editorial Board of FOCUS, designated by the faculty associations of Utah's five community colleges, will review all manuscripts and determine which articles will be included in the journal. Consideration will be given to both the subject matter presented and the quality of the presentation.

Publication Date: September, 1993

Questions: Please contact your campus representative on the Editorial Board or the Editor, in the Commissioner's Office, or phone (801) 538-5247.

The Editorial Board
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